THE EDITION OF THE WIKIPEDIA AS AN ACADEMIC ACTIVITY

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ABSTRACT

This paper presents a learning activity around the Wikipedia, a free on-line encyclopaedia written by its users. Students are asked to write and review entries related to the course topics following a collaborative environment provided by the wiki tools. This paper proposes a seventeen-steps methodology for this task in the framework of an academic course organized by topics. The activity has been successfully introduced in a two different schools of the Technical University of Catalonia. In its first edition, 81 new articles were added by 64 students from the EUETIT, in the second experience 60 articles were created and 14 reviewed by 43 students from the ETSETB.

INTRODUCTION

In many courses, teachers ask their students to write a document about a certain topic. The main objectives of such an activity are to developed the students'capabilities to search for information, understand it, organize it and synthesize it on a document. Before the Internet era, the main source of information were paper documents in the form of books or magazines, normally accessed in the library. The resulting text was confined to the instructor's files and, in the best of the cases, later reused by students in future assignments. Nowadays though, this is not the usual process anymore. Students search for information on the Internet and reuse the documents found to create their own works. In some cases, students minimize their effort by applying a cut and paste strategy; in the worst cases, without even reading the texts. This practise is difficult to detect by instructors as they may not be familiar with the source of information. One of the main websites used by students is the Wikipedia. This paper proposes to change the way how students use it, not as readers but as writers. The methodology aims at guaranteeing the accomplishment of the learning goals as well as expanding them to match the present trends in electronic document writing.

THE WIKIPEDIA

The wikipedia [1] is an on-line multilingual encyclopaedia that has experienced a tremendous growth during the last years. The basic idea is to allow its users to add new content and modify existing one by the use of a software called MediaWiki [2]. Changes are monitored and reviewed by other users in order to improve the quality and extension of the wikipedia contents. By doing so, entries are improved following the basic principles of collaborative work. The strategy is inherited from the free software principles, by which the source code is tested and debugged on a collaborative basis. In both cases, the Internet allows fast and efficient exchange of information among contributors in a very flexible and configurable framework. Wikipedia detractors criticize that as anyone can modify its contents, erroneous or imprecise information can be added, as nobody guarantees its quality [3]. For this reason, the Wikipedia foundation has recently started a new project in which qualified experts must approve any new content before its publication [4].

OBJECTIVES

This paper presents an active learning methodology that preserves the original goals of the assignment and extends them in the use of Wikipedia. The proposed goals are the following:

a) Identify the most relevant terms of a professional text written in English.
b) Explain one of the relevant terms in a new entry of the Wikipedia.
c) Summarize the contribution in an oral presentation.
d) Review and improve another existing Wikipedia entry related to the article.

Goals from a) to c) are classic goals in many courses according to the competences exposed by the Bloom's Taxonomy [5]. In order to achieve objective a), students must have a *knowledge* of the technical terminology used in a professional article and *comprehend* their use. The selected text must match the level of expertise acquired by the students, which may vary depending on the course year. In case that the article is written in a language which does not correspond to the education centre official language/s, the activity may imply an extra effort for the student. Objectives b) and c) require a deeper *analysis* of the article and, probably, other sources of information such us books, web pages or magazines. The student must synthesize the information found to finally produce a summary of the term chosen in a). The difference between objectives b) and c) differ in the communication skills. While in b) students must create a new Wikipedia entry by using the wiki tools for text edition, objective c) aims at an oral presentation of their work in front of their class mates. Finally, objective d) requires an evaluation and improvement of somebody else's work. By doing so, they interact with other wiki authors and, as a result, they may have to justify their modifications in a web-based discussion.

It must be noted that objectives b) and d) drive students' work out of the course because they make it public to the whole world. Their texts will not only be reviewed by the instructor but by the Wikipedia community. In addition, their work is open and accessible to other people searching for information, and by doing so, students contribute to the university's task of spreading rigorous knowledge to the rest of society. New entries are especially relevant in those cases in which the scientific/technical documentation is mostly in English but student's mother tongue is not. The resulting entries will probably be written in the mother tongue and will allow the access to this information to other people from the same linguistic community.

METHODOLOGY

A methodology was defined and tested in order to achieve the presented objectives. It consisted on seventeen steps organized as follows:

a) Selection of topics and texts (professor): The professor selects a set of texts published in magazines. The level of expertise required for their understanding must match the students competences. Texts should be chosen to focus on a topic that extends the content of the regular course, for example, with some recent advances or studies. The amount of texts should be equal or greater than the amount of students, being the final amount related to a topic proportional to the weight of the topic in the course.

b) Activity presentation (professor): The professor presents the activity to the students, the work plan and deadlines. Explaining all steps of the activity will help students to organize their time and understand the motivation of all involved tasks. Students must know that they will have to review a Wikipedia entry, create a new one and prepare an oral presentation for a certain date. After a general view of the methodology, the professor presents the topics with a brief description and some examples.

c) Expression of preferred topics (students): The list of topics and the complete set of texts are made public. Students are asked to express their preferences about the topics in an ordered list. They are encouraged to make their selection according to their personal interests but also according to the time constraints and deadlines. Normally the amount of topics will be fewer than the amount of students, so that topics will be assigned to groups of students. If this is the case, the expression of interest can already be done in groups which will be further referred with a unique ID, for example, the name of the topic.

d) Distribution of topics (professor): The professor distributes topics among the students trying to respect their preferences. At this point, conflicts among students' interests may appear and may be solved after discussion among students or according to a priority criterion set by the professor. Together with his/her topic, each student will have a text assigned that matches the topic.

e) Distribution of articles to review (professor): Simultaneously to the distribution of topics and texts, the professor will assign an already existing Wikipedia article to each topic group. This article will be related to the contents of the article and, according to the professor's criterion, require a deep revision and/or extension. The selected articles can basically have two origins. First, an article that had been generated in a previous edition of the activity but whose results were not satisfactory enough. The professor can use the past evaluation marks to quickly detect which of the past works require an improvement. In case the professor cannot find any candidate, he/she can find one among the Wikipedia texts written by external authors. These articles can be found just by browsing those Wikipedia pages which are related to the terminology that appears in the text that students must read. Candidate articles can be found with the search engine included in the Wikipedia submitting keywords present in the article. Another possible method is to visit the special section in the Wikipedia where article authors ask for help. Each version of the Wikipedia has its own to do list with hundreds of tasks and requests for assistance. It is easy to locate there an already existing article that matches the topic and needs some revision. Together with the Wikipedia article, the professor should provide the students with a brief suggestion of the improvements that can be performed.

f) Reading of texts (students): Students read the assigned text. Comprehension problems may appear during this task, especially if the text is written in a language not familiar to the student. If this is the case, the student will look for assistance, external or from the other members of the topic group. In case that problems

appear in the meaning of a terminology specific to the topic, the student will first search information about the term in the Wikipedia. If he/she cannot find it there, the word must be added to a list of candidates of new articles in the Wikipedia. Of course, the student must look for the meaning of the term in other sources and take note of the references in case he/she would need them again in the future.

g) Proposal of new articles (students): After reading the text, students are asked to make a proposal of one or more terms that must satisfy three conditions. Firstly, that it does not exist any Wikipedia article describing this term. Secondly, that the terms understanding is relevant for a good comprehension of the text. Thirdly, that the terms are relevant for the assigned topic and, consequently, of general interest. It must be noted that students are free to choose the language of the Wikipedia version in which they want to contribute, as long as the professor has sufficient knowledge of the language to evaluate the final result. The previous assignment of a term to review will facilitate the selection as they will become familiar with the Wikipedia environment.

h) Discussion and acceptance of new articles (professor): The proposed new articles are assessed by the professor to ensure the accomplishment of the three basic conditions. Depending on the proposal, the professor can suggest other articles that substitute or complement the proposed ones. In those cases where an article for the term already exists in the Wikipedia in another language, the professor should emphasize that new the article should be completely original and more complete than the existing version. The student must be clearly disencouraged to write a translation of previous Wikipedia article.

i) Review of articles (students): The articles to review are improved by the topic groups. During this task students work in group and become familiar with the edition tools provided by the Wikipedia. Before doing any modification, students must create an account in the Wikipedia and communicate their usernames to the professor. By doing so, the work of each student can be easily tracked by the professor even if external contributors work on the articles. Each Wikipedia article has an associated history tool that keeps all previous versions of the article, as well as who and where they were modified. Before starting the Wikipedia edition, students are asked to read the instructions provided by the Wikipedia about how to create or modify an entry. At this stage starts the core part of the activity. It is important to give very precise and clear instructions to the students as they will face a working methodology that may be new for them.

j) Creation of articles (students): After the revision of an article in group, students face the creation of a completely new article as previously agreed with the professor. The extension of the text should be similar to the rest of the entries, being 500 words a minimum amount that should be fulfilled by all entries. Optionally, students may distribute these 500 words in more than an entry, whether by choosing more than one concept or by creating multilingual versions of the entries. Professor must make sure that students work on the content as well as on the format, using table of contents, sections, links, multilingual references and, if possible, audiovisual content available from the WikiCommons project. Students must not violate any copyright law, as well as be aware that the result of their work will be published under a Creative Commons license [6]. In many cases a translation of the term will be required and students must be directed to the competent linguistic bodies. Once a stable version of the text is ready, students will communicate to the professor the URL and usernames related to the new articles. A deadline for the creation of the articles must be set, even if the articles are further improved until the final version.

k) Review and discussion of articles (professor and students): After receiving the new entries, an internal discussion starts between professor and students. The goal of this phase is to provide an expert feedback to students about possible improvements to the new entry. Professor must guide the students work according to

its evaluation guides (discussed later) in order to ensure the quality and accuracy of the final texts. The professor creates a public list of the reviewed and new articles that extend the discussion to the rest of students, opening the door to a collaborative work. This discussion should be internal to the course participants as very specific references to the course may appear during discussion. However, it is probable that also external feedback reaches the students through the open discussion forums associated to each Wikipedia entry. In case that new articles do not satisfy the minimum quality standards of the Wikipedia, a reviewer of the Wikipedia community will alert of the situation with a warning sign on the article. In order to track students articles, the professor should also create an account on each linguistic version of the Wikipedia and toggle the "watch" flag on for each article created by the students. By doing so, a simple look to the watch list tool provided by the Wikipedia will let the professor detect the latest modifications in the students' articles.

l) Submission of final articles (students): Reviewed and new articles must be submitted to the professor for its evaluation. Although a direct evaluation of the Wikipedia would be possible, the constant changes and new versions of the text might drive to correction problems. For this reason, students must submit a frozen version of the text. In the case of the revisions, the original text should also be included so that improvements can be easily assessed. Normally, the Wikipedia articles will continue evolving as any other article in the encyclopaedia. Professors can also ask for some statistical results such as the final amount of reviewed and created articles, the extension of the new text or how many links to other articles have been included.

m) Oral presentation (students): The final results are presented to the rest of the class with an oral presentation in topic groups. Firstly, students must explain the improvements in the reviewed article comparing them to the original one. Secondly, each student must present his/her new article(s) justifying the importance of the chosen term in the assigned article. The presentation in digital format must be previously generated and sent to the professor in order to check the correct format. It is recommended to ask for PDF files as they present less technical problems during their visualization. The first page of the presentation must include the names of the students, the list of articles and group topic. Afterwards, pages describing the entries must include, at least, a screenshot of the final result and the URL where the article can be found. Students must also attend to the rest of the presentations as their contents are part of the course and will appear in a future evaluation test.

n) Oral and articles evaluation (professor): After the last oral presentation, the professor should evaluate the presentation and submitted versions of the articles. By waiting after the oral presentation, the students' communication skills during the oral session are better assessed as the professor has not yet performed a deep review on the articles. The evaluation has three parts: oral presentation, reviewed article(s) and new article(s). The evaluation of the oral presentation should include aspects such as on-time delivery of the PDF, accomplishments of format specifications, slides design, student's communication skills, structure and rigurosity of the speech and respect to the time constraints set by the professor. The evaluation of the reviewed article is done on a topic group basis and should consider the improvements on the article in terms of new text, figures, links, structure or table of contents. Professor must check how those improvements recommended during the task assignment have been managed by students. The evaluation of the new articles must take into account the relevance of the new term(s) in the assigned text and for the public interest, the accomplishment of Wikipedia style book, the discussions during the writing, their impact on the final text and any external comment posted on the open forum of the Wikipedia page. Those texts suspicious of being a result of copy & paste operations should be especially considered and its originality checked, for example, with a web search engine. Corrections can be made directly on the text or discussed in the debate tools

provided by the Wikipedia. During evaluation, the professor will also take note of those entries that require improvement in future editions of the activity. In case that an entry does not fulfil the minimum quality level, instructor should ask for its deletion from the Wikipedia.

o) Activity feedback (students): After the most important part of the activity, students are encouraged to send their feedback about the followed methodology. Their opinion may help to improve the complete process in future editions of the activity.

p) Reading and improvement of articles (students): Students are encouraged to read those articles reviewed and created by their classmates. They are also encouraged to improve the texts through the discussion forums related to each entry or through a direct edition of the texts. Their attendance to the oral presentations will make the reading easier and may clarify some of the doubts that might have arisen.

q) Short questions in test (professor): The knowledge of the students about contents of the oral presentation and Wikipedia articles are assessed with short questions in a final test. These questions may be part of a global test as this activity has been designed in the framework of a broader course. It is advisable to include these questions in the final evaluation test as otherwise students might consider this information irrelevant and not pay enough attention to their classmates oral presentations and Wikipedia articles.

RESULTS

The presented activity was firstly applied during the Fall semester 2005 in the University School of Technical Industrial Engineering in Terrassa (EUETIT) and secondly during Spring 2006 in the Superior Technical School of Telecommunications Engineering in Barcelona (ETSETB), both part of the Technical University of Catalonia (UPC). The described methodology was applied in the two cases with some particularities and differences. This section describes the two experiences and their results.

EUETIT

Target students were in their third and last year of studies in the Diploma of Audio and Image for Telecommunications. As this was the first experience, there did not exist previous entries to review, so students only created new ones. From a total of 64 students that followed the activity, 81 Wikipedia entries were created. Among them, 42 were written in Catalan, 20 in Spanish, 18 had a version in Catalan and another one in Spanish and only one entry had a third version in English. Most of the resulting texts presented a similar quality to the rest of the Wikipedia, but some others were far below. Most of the problems were detected by external contributors and referred to format or categorization issues. In this case only one professor designed and supervised the activity.

The activity set a specific deadline for each topic group distributed along the course. Oral presentations in class were given after a the topic was presented in class by the professor following the regular course schedule. This philosophy allowed students to have the basic concepts fresh and made presentations more attractive as only a small number of presentations were given in each session. This planning allowed that professor could focus in an specific topic each week, that matched the regular topic in class. The whole planning give a good compactness and coherency to the course. The main problems

appeared because of a rudimentary communication tool between students and professor. The on-line course management tool provided by the university did not offer enough functionalities for the complexity of the activity. Communication among students from different group topics was almost non-existent, at least through the course management tool. Another important source of problem was the novelty of the activity. In some situations, students missed some guidelines that were progressively provided by a digital document that served them as a handbook. The complete list of articles is shown in Table 1. Figure 1 shows a screenshot of one of the articles created in the EUETIT.

New articles

- Ample de banda
- Baud
- Broadcast
- Broadcast flag
- CBR [es]
- Ciclo de desarrollo
- Cinelerra
- Circuit tancat de televisió [es]
- Còdec d'àudio
- Codificador de vídeo [es]
- COFDM [es]
- Compressió per wavelets
- Comunicación multimodal
- Corba d'evaluació de qualitat [es]
- Cordes vocals
- CPRM
- DAB
- DAT
- Dirac
- Detector de moviment [es]
- Digitalización de vídeo
- Disparitat binocular [es]
- frecuencial
- Escàner
- Eureka 147
- Exploració entrellaçada [es]
- Exploración progresiva
- Flux de dades
- Fotograma
- Freeviewpoint television [es]
- Frame
- Frame de película
- FreeJ [es] [en]
- Grating Light Valve [es]
- Gravador personal de vídeo
- Heinrich Geissler
- Hittorf
- HDTV
- IPTV
- Làser d'estat sòlid
- LCD
- Ley de Moore
- Leyes sobre privacidad
- Llei Eldred
- Lliga per a la llibertat de programació
- Llum coherent [es]
- Modulador de quadratura
- Middleware
- Multiplexor
- Pantalla de plasma
- Pirateria
- Píxel
- Privacidad
- Privacidad en Internet
- Processador digital del senyal
- Propietat intel·lectual
- Quadre
- Raigs catòdics
- Reassignació d'espectre [es]
- RFID
- Sensors biomètrics
- Speex
- Triple play
- Taxa de bits
- TECO
- TIA
- Time-slicing [es]
- Tub de raigs catòdics
- Ulleres anaglifo [es]
- Ultrawideband
- Vòxel [es]

Table 1: .

Figure 1: http://ca.wikipedia.org/wiki/TRC

ETSETB

Target students were in their two last years of studies in the Degree of Telecommunication Engineering. The three main differences compared to the previous experience were the higher skills and knowledge of students, the increase in the number of professors from one to three, a better planning of the whole activity thanks to the previous experience and an on-line course management systems based on Moodle [7] (see Figure 2). From a total of 43 students that followed the activity, 60 Wikipedia entries were created and 14 reviewed. Among the new articles, 20 were written only in Catalan, 25 in Spanish, 3 in English, 10 had a version in Catalan and another one in Spanish, and 3 a Spanish and English version. Three professors supervised the activity, having each of them a subset of topics related to their expertise.

In the ETSETB the planned schedule was different from the EUETIT one. The on-line management tool gained relevance thanks to the discussion forums that facilitated communication among professors and students. The main difference in the schedule was that deadlines were common to all students, concentrating all oral presentations at the end of the course. This organization created important peaks of workload to professors who, due to other simultaneous research and academic tasks, could not review the articles as originally planned. The situation was solved with a redistribution of tasks and topics among professors. The quality of the oral presentations and final articles was higher than in the previous experience. The on-line discussion tool facilitated that students organized themselves to create some complementary articles related to similar topics. Most of the problems in the texts were detected by external contributors and referred to format or categorization issues. In this case only one professor designed and supervised the activity. A copyright infringement was detected by the Wikipedia community due to a deliberate copy of a text from another academic institution. At the end of the activity students expressed enthusiasm, especially because their work had become public and useful to everybody. The complete list of articles is shown in Table ??.

Reviewed articles

- Broadcast flag
- Còdec d'àudio
- Còdec de vídeo
- COFDM
- DVB-H
- Exploració entrellaçada [es]
- FEC
- HDTV
- IPTV
- Pantalla de cristall líquid
- Pirateria
- Privacidad
- Programari intermediari
- Propietat intel·lectual
- Taxa de bits

New articles

- Adaptive deblocking filter
- Balance de blancos
- Banco de filtres híbrido
- Block matching [es]
- Blu-ray
- Broadcast Protection Discussion Group [es]
- CCIR 601
- Còdec de vídeo [es]
- Compensación de movimiento
- Control patern [es]
- Directiva de la Unión Europea sobre Derechos de Autor
- Digital Item
- Digital Multimedia Broadcasting [es]
- DMCA (Acta de Derechos de Autor Milenio Digital)
- Dspace
- DVB
- DVB-CPCM
- DVB-H [es]
- Efecte de Haas
- Efecto bloque
- Emmascarament freqüencial
- Empremta digital [es]
- Estabilizador de imagen
- Estudio virtual
- Flux de dades de vídeo
- Gravador personal de vídeo [es]
- Guia Electrònica de Programes (EPG) [es]
- Handover
- HD-DVD
- Imagen fantasma
- Imágenes I, P i B
- ISDB
- Key Selection Vector (KSV) [es]
- Latencia (DTV)
- Marca de agua digital
- Masking threshold
- MediaHighway [es]
- MHP [es]
- Monitor virtual de retina
- MP3
- MPE-FEC
- NTSC
- PAL
- Pantalla d'escombrat volumètric
- Protocol de flux de dades en temps real (RTSP)
- P2PTV
- RAID
- Receptor de televisió
- Schema
- SECAM
- Showview [es]
- SMR
- TiVo [es]
- TFT
- TV-Anytime
- Umbral de emmascaramiento
- Umbral de emmascaramiento global
- Validación XML
- Video Coding Experts Group (VCEG)

Table 2: Articles reviewed and created by ETSETB students

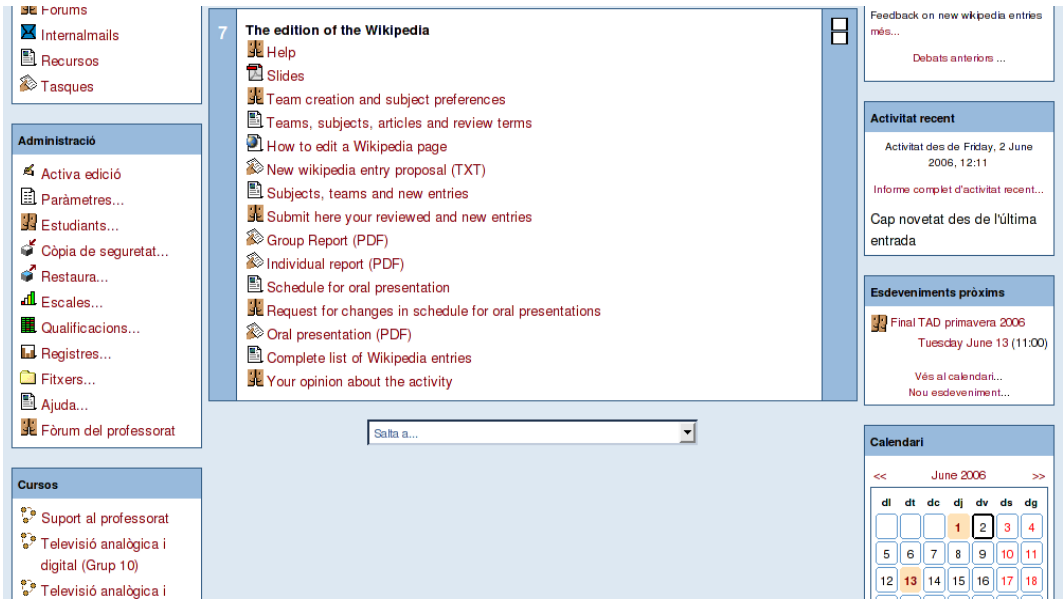

Figure 2: Moodle web interface used in the ETSETB course

CONCLUSIONS

The presented activity proposed an innovative learning methodology in order to accomplish classical objectives present in many university courses. The Wikipedia, a typical source of information for university and high school students, becomes a repository of works, facilitating their evaluation and making the effort of the students valuable for all the society. Students' interest is boasted by seeing their work published on-line and using edition techniques common to most of the wikis. The activity has already been tested on a large group with satisfactory results that recommended its continuity. As a result, the experience will be extended to students in the 2006/2007 year and will be drive to the creation of a WikiProject [8], collection of pages devoted to the management of a specific family of information within the Wikipedia.

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